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The Application of Storage Batteries to Isolated Plants.

TYPICAL INSTALLATIONS

OF

TRADE MARK

"Chloride Accumulators"

REGISTERED SEPTEMBER 11, 1894.

IN

Mills and Factories

THE ELECTRIC STORAGE BATTERY CO.

Allegheny Avenue and 19th Street,

PHILADELPHIA, PA.

SALES OFFICES:

NEW YORK, 100 Broadway.
BOSTON, 60 State St.
BALTIMORE, Equitable Building.
CHICAGO, Marquette Building.
ST. LOUIS, Wainwright Building.
SAN FRANCISCO, Nevada Block.
CLEVELAND, New England Building.

The "Chloride Accumulator" in Mills and Factories.

There is probably no class of service in which the manifold utility of the storage battery as an adjunct to an electric lighting and power plant is more fully illustrated than in its application to the requirements of mills and factories. One great step in advance was made when the introduc-

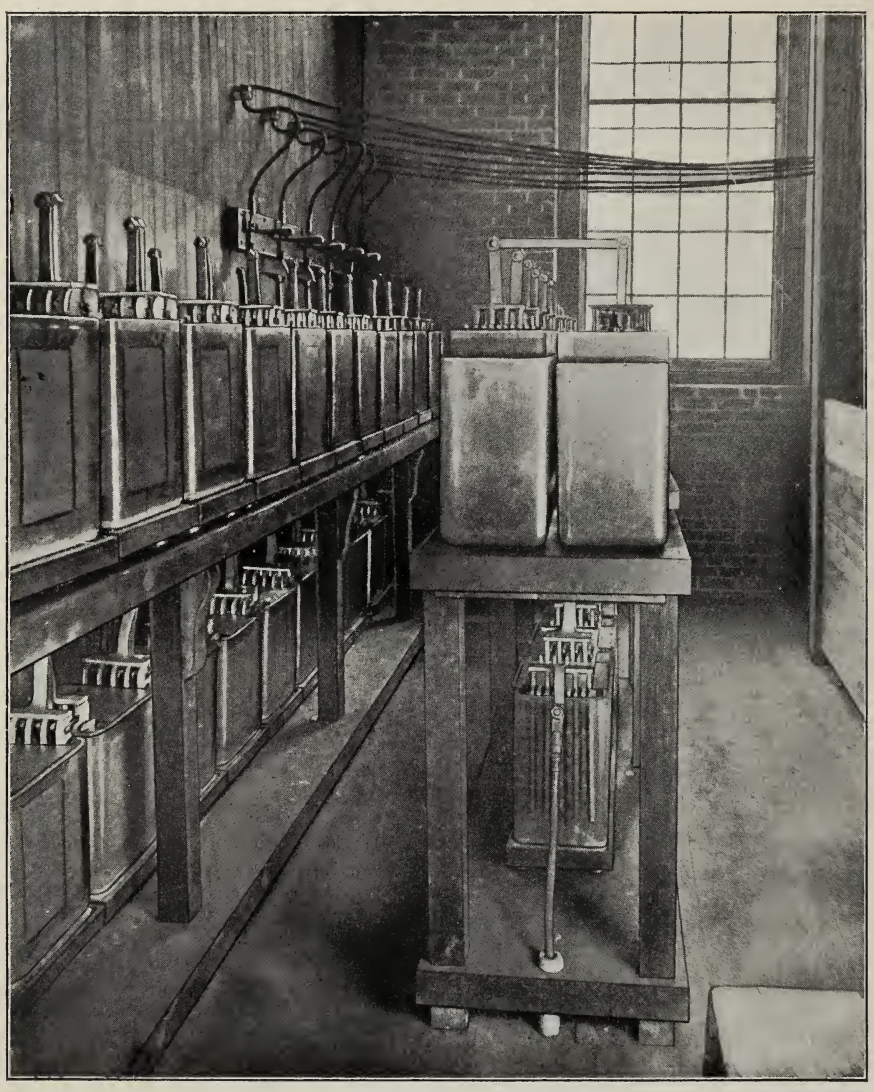

FIG. 1.—BATTERY ROOM, ARNOLD PRINT WORKS.

tion of the electric light revolutionized the methods of illumination. The next advance consisted in the direct application of the electric motor for driving the machinery, thus doing away with a mass of belts and counter-shafting which formerly absorbed more than half of the power developed. The

third and by no means least important step in the line of increased economy, reliability and convenience of operation is the installation of the storage battery auxiliary.

The demand made upon the electric plant of a factory varies over a wide range. For illumination, a few lights may be required through the day, which are increased to the full maximum for an hour or two before shutting down, after which the office may require light for a short time and several lights may be needed through the night; there is frequently a morning peak also. Still more variable and far more uncertain is the motor load, corresponding as it does to the intermittent service of cranes, tools and other machinery.

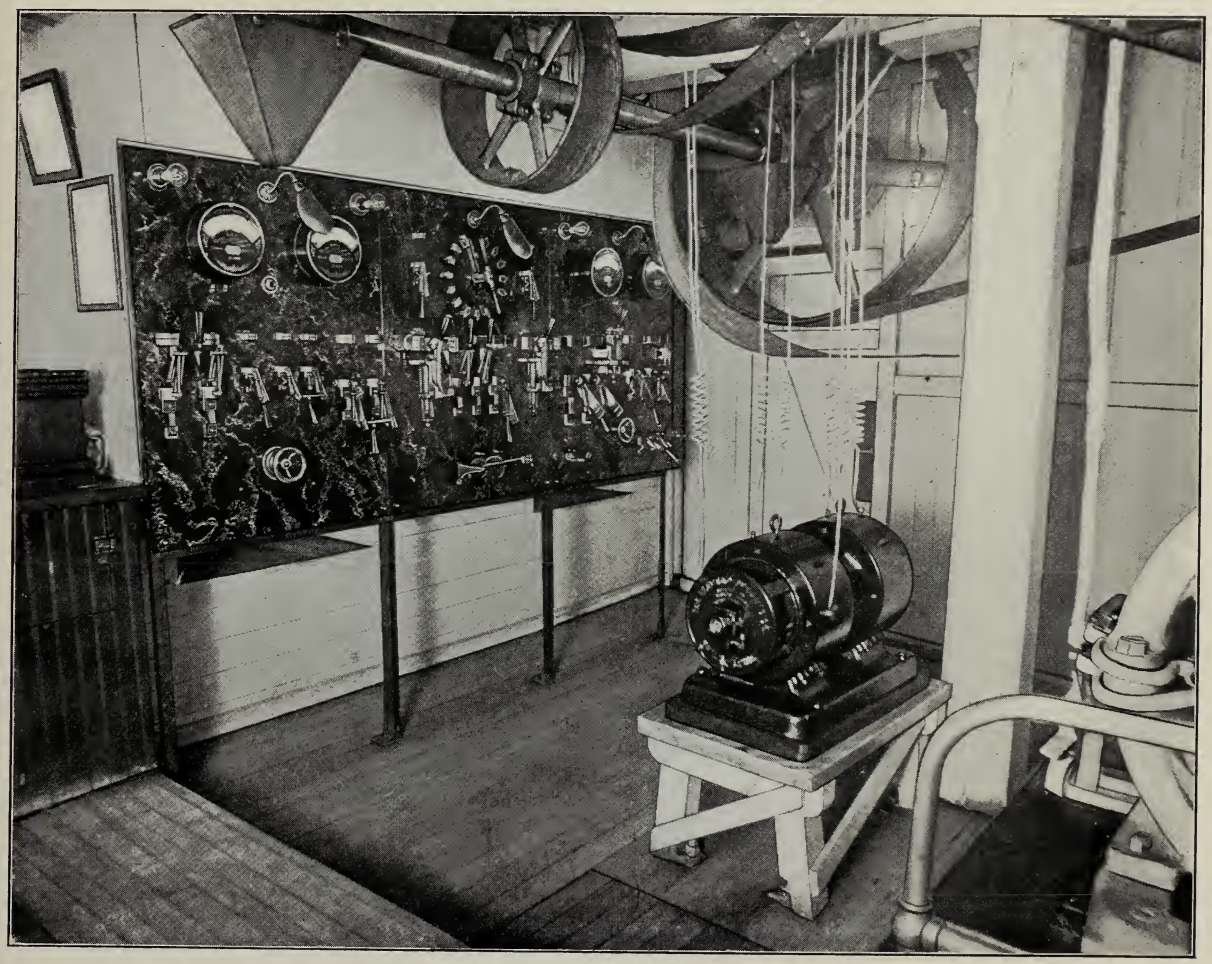

FIG. 2.—SWITCHBOARD AND BOOSTER, ARNOLD PRINT WORKS.

The electric plant must be designed of sufficient capacity to meet the maximum load that will ever fall upon it. A large part of this maximum will be of very short duration and the cost of the installation with a battery to take care of the peaks and fluctuations and a steam plant for the more sustained portions of the load will be approximately the same as if the whole capacity were installed in machinery. The results of operation in the two cases will be widely different. Without the battery, a sufficient capacity of engines and boilers must be kept in service at all times to meet any momentary demand that may come. The greater part of the time, this machinery must therefore be operated under a very light and uneconomical load. On the other hand, with a battery always ready

to respond automatically to sudden demands, only a small capacity of machinery need be in service, loaded to the most economical point. After the plant is shut down at night the same battery will furnish such small amount of light and power as may be required through the night or for overtime work, with either no attendance at all or only such as the ordinary watchman is competent to supply, thus effecting a marked saving in labor as well as fuel. The storage battery also solves in the most

FIG. 3.—BATTERY ROOM, JONES BROS.

thoroughly satisfactory manner the question of supplying current for lights and intermittent power from the same machine without affecting the steadiness of the illumination, thus effecting a further economy by concentrating the entire load on one unit; at the same time obviating the flickering of the lights which would ensue if that unit were subjected to all the fluctuations of the motor load.

In cases of emergency, whether it be an unexpected and excessive overload, or an accident to the generating machinery, a storage battery is of inestimable service, being always ready at an instant's notice to do its work. It will thus often, by permitting the machinery to be stopped on the first appearance of trouble, avoid a more serious and prolonged shut-down.

Among the noteworthy installations of this character may be mentioned that at the Arnold Print Works, North Adams, Mass. The battery shown in Figure 1, consisting of sixty "Chloride Accumu-

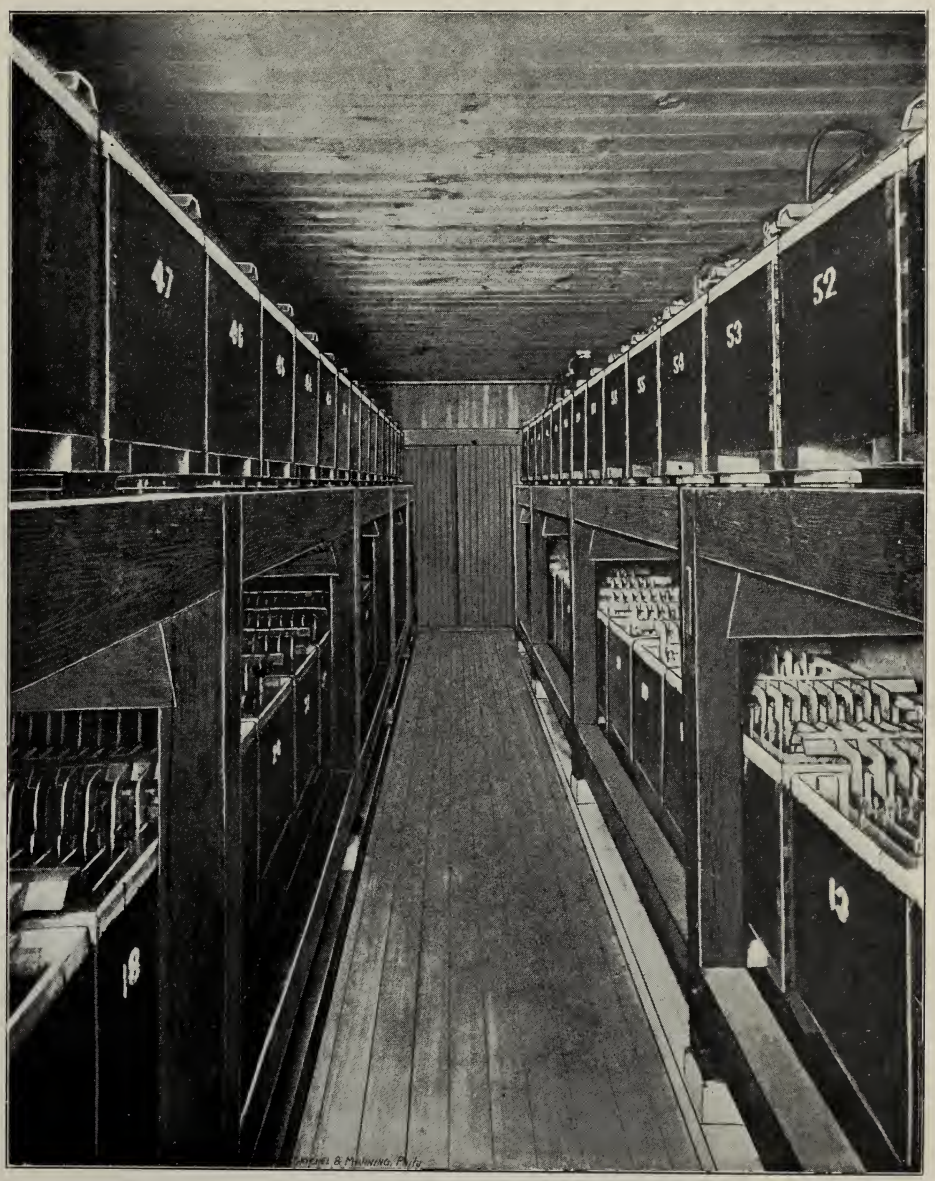

FIG. 4.—BATTERY ROOM, R. & H. SIMON.

lators," Type F-9, in glass jars, is arranged for use in the various ways above enumerated, and is operated in connection with a 60-kw., 125-volt generator, belted to a counter-shaft driven by a 250-h. p. Harris-Corliss, single-expansion, non-condensing engine, whose capacity is used principally for driving other machinery. Figure 2 shows the switchboard and constant current booster, the latter

being so designed as to throw the fluctuations of the elevator load upon the battery. Night lighting is one of the important functions of this plant, which would otherwise necessitate the operation of the 250-h. p. engine, carrying a friction load of thirty h. p., for developing four or five h. p. of electrical energy, and requiring the additional attendance of an engineer.

Another installation of somewhat similar character is that at the factory of Jones Bros., in Brooklyn, N. Y., who are engaged in the preparation of coffees and spices. Figure 3 shows the

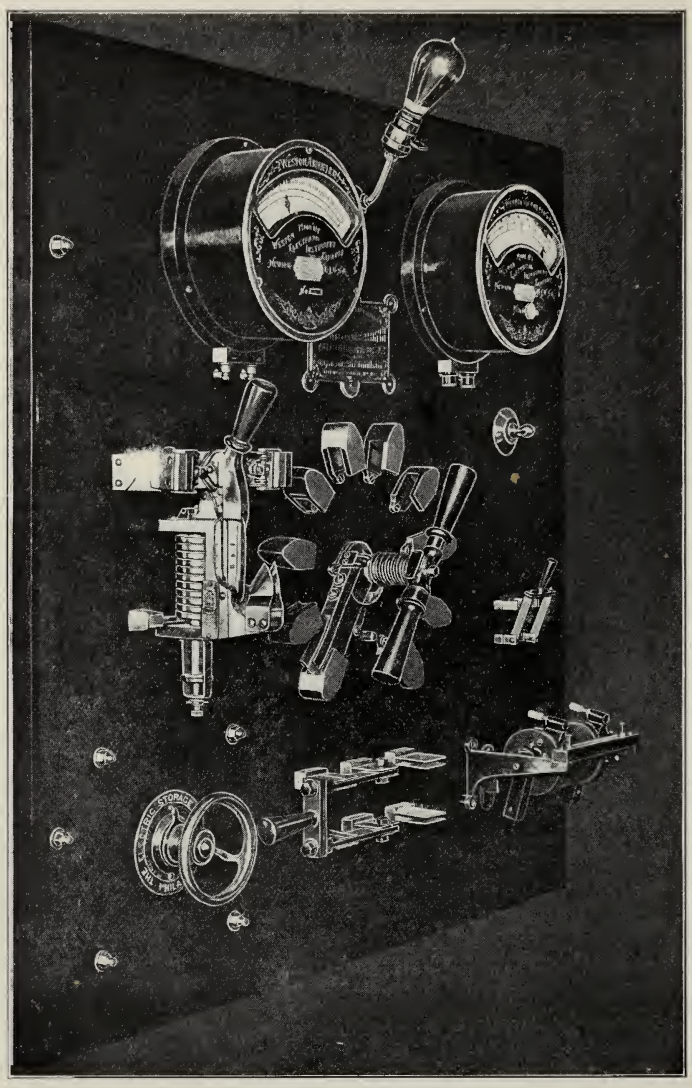

FIG. 5.—SWITCHBOARD, R. & H. SIMON.

battery, consisting of 138 cells of "Chloride Accumulators," Type E-7, arranged on wooden racks in three tiers. This battery is operated in connection with a 75-kw., 235-volt generator, and its principal use is for supplying a few lights for the factory and offices after the machinery is shut down. A motor-driven charging booster was installed with the battery, and voltage regulation is effected by means of fifteen counter electro-motive force cells, connected to a 16-point end cell switch in the office.

The battery installed in the silk mill of R. & H. Simon, Union Hill, N. J., illustrated in Figure 4, is of larger capacity than either of the preceding, consisting of sixty-four cells of Type F-17 "Chloride Accumulators" in lead lined wooden tanks. This battery is utilized to assist the generating machinery on the peak of the load as well as to supply lights through the mill and in the residence of Mr. Simon, after the plant is shut down. Figure 5 shows the switchboard with the 10-point regulating switch. Figure 6 is a load diagram showing the operation of this battery during the usual Saturday afternoon run. The comparatively small amount of charging here shown is due to the fact that the battery was only partially discharged the day before.

In Figure 7 is illustrated the effect of a storage battery on a fluctuating load. This is a load diagram showing the operation of a battery of "Chloride Accumulators" in the Commercial Cable Building, New York City. The severe fluctuations of load are caused by the starting and stopping of

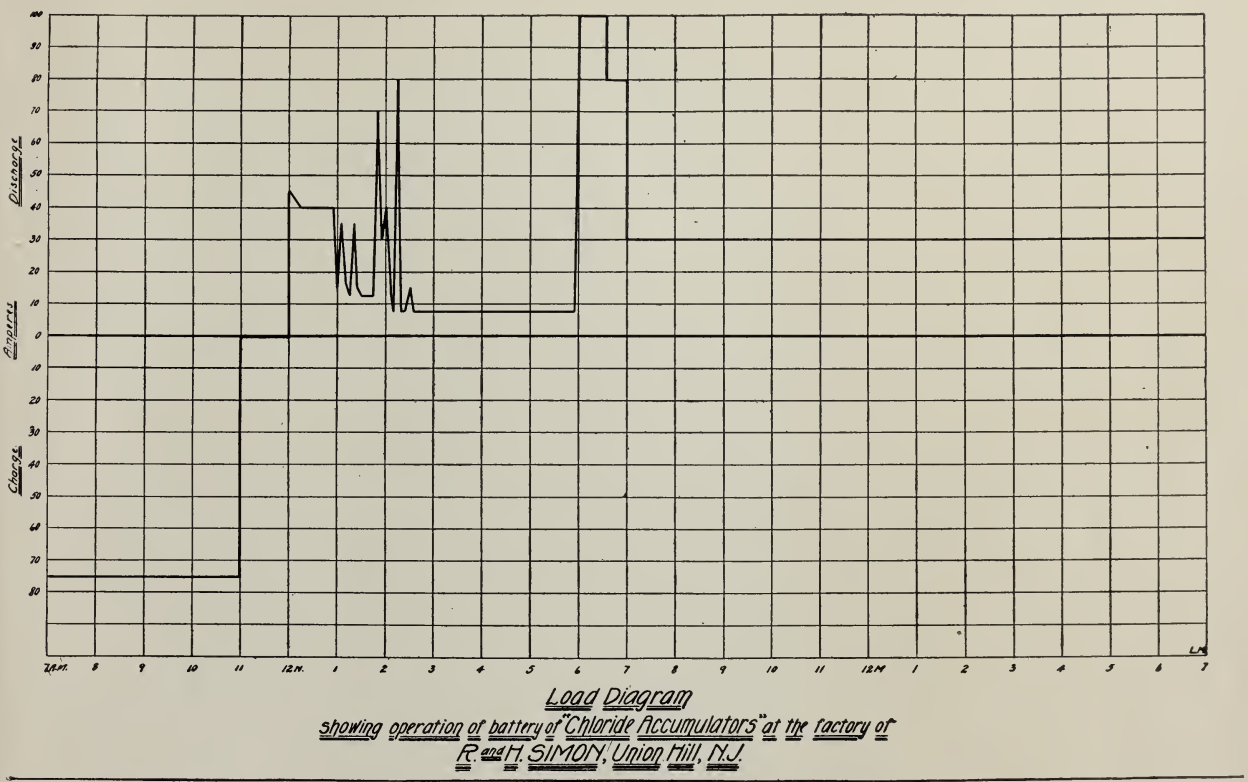

FIG. 6.

electric elevators, and the steadiness of the load on the generators produced by throwing these fluctuations on the battery, and the resulting steadiness of voltage, are very evident.

The Electric Storage Battery Co. invites correspondence, and upon request of the proprietor or manager of a factory will be pleased to investigate and submit a report showing the results to be obtained from an installation of "Chloride Accumulators."

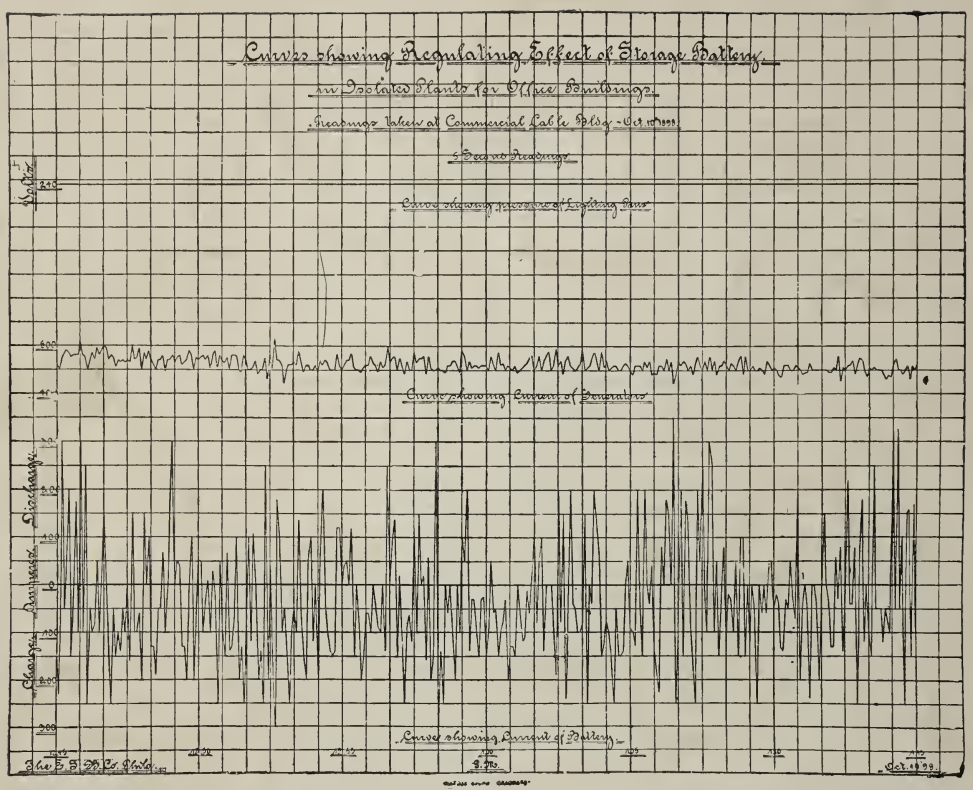

FIG. 7.